ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Part 90 of the	)	
Commission's Rules to Adopt	)	PR Docket No. 93-61
Regulations for Automatic	)	
Vehicle Monitoring Systems	)	

PETITION FOR RECONSIDERATION OF PINPOINT COMMUNICATIONS, INC.

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Pinpoint Communications, Inc. ("Pinpoint"), by its attorneys, hereby submits this petition for reconsideration of the Report and Order ("*Order*") in the above-captioned proceeding.[1]

I. INTRODUCTION AND SUMMARY

The *Order* admirably attempts to strike an equitable balance among the operational needs of the users of the 902-928 MHz band: Location and Monitoring Service ("LMS") licensees, and the two classes of lower priority users, amateur operations, and unlicensed Part 15 devices. Pinpoint submits, however, that, to maximize the public benefits from LMS systems, certain aspects of the new rules require modification. Fortunately, this can be done without fundamentally upsetting the *Order*'s attempt to balance divergent interests.

Pinpoint strongly supports the FCC goal in this proceeding of advancing the efficiency of the nation's transportation infrastructure by encouraging the further development and

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[1] *Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems* in PR Docket No. 93-61, FCC 95-41 (rel. Feb. 6, 1995). The new rules and a summary of the *Order* were published at 60 Fed. Reg. 15248 (March 23, 1995). The new rule sections referred to herein follow the numbering used in the *Federal Register*.

deployment of an LMS industry.[2] Pinpoint concurs that, in order to attain this end, it is vital that the rules adopted for LMS allow "efficient and competitive use of the spectrum" and provide the requisite certainty among users of the band so that LMS developers can raise the capital necessary to construct systems.[3]

While Pinpoint believes that the *Order* makes important strides in realizing the FCC's goals, it submits that the rules adopted fall short in significant respects from the asserted objectives: Without modification, the new rules will restrict the diversity, as well as the economic viability, of multilateration LMS system operators. By making the limited modifications summarized below, the FCC will greatly improve the ability of small entrepreneurial LMS developers to serve American consumers:

- *Shared Use of Spectrum*
  The FCC should not auction all multilateration spectrum. Rather, the FCC should provide for a shared sub-band. The record in this proceeding clearly demonstrates that sharing among multilateration licensees is feasible. Creation of a shared sub-band would fulfill the FCC's statutory obligation to avoid mutual exclusivity where possible and, thus, the need for competitive bidding. Moreover, a shared sub-band would further the public interest in efficient and competitive LMS service by encouraging multilateration system developers to design and deploy spectrally efficient systems.

- *Grandfathering Rules*
  The grandfathering rules appropriately recognize that allowing existing multilateration licensees to construct and operate systems will spur the rapid deployment of high quality service to the public at prices constrained by competition among existing licensees and new MTA licensees. In order to reap the benefits of such competition, however, the FCC must ensure that all licensees have a reasonable chance to succeed

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[2] *See Order* at ¶¶ 3, 99. The Commission's goal is consistent with the Intelligent Vehicle-Highway Systems Act of 1991 ("IVHSA"), which mandates the development, operational testing, and implementation of intelligent transportation systems ("ITS"). The IVHSA was enacted to promote advanced traffic management systems, enhanced traveler information systems, commercial vehicle operations, and advanced public transportation systems.

[3] *Id.* at ¶ 2.

in the marketplace. Accordingly, the FCC should allow grandfathered licensees to: (1) build out within the BTAs in which they are licensed; (2) move their antenna sites after the construction deadline due to circumstances beyond their control; and (3) modify their licenses after the construction deadline to add additional mobiles, implement improvements in their systems, or facilitate sharing. To foster fair competition among grandfathered licensees, the FCC also should limit the number of grandfathered licenses to twenty-five BTAs.

- *Sub-Band Emission Mask Requirement*
  The new emission mask for multilateration systems is untenable, if not impossible. Moreover, it far exceeds the limits imposed on similar services. Indeed, virtually all LMS providers opposed the mask as proposed in the *NPRM*. Yet the FCC adopted the proposal without providing any meaningful rationale. The specification is completely inappropriate for a digitally modulated emission in a mobile environment. If the FCC is to attain its goal of encouraging the deployment of LMS service, it is essential that the FCC adopt the specifications proposed herein, which is the result of consensus among all multilateration and the major non-multilateration proponents in this proceeding.

- *The Status of Multilateration LMS, Part 15, and Amateur Operations*
  The *Order*, while professing to reaffirm the secondary status of Part 15 devices and amateur operations, for all meaningful purposes makes multilateration LMS systems secondary in a broad range of circumstances. To conform the new rules to statutory dictates and established Commission precedent, the FCC should eliminate the requirement that MTA auction winners demonstrate that they will not cause "unacceptable levels of interference" to Part 15 devices. Further, the Commission should make the new presumption against harmful interference from Part 15 devices rebuttable.

- *Equipment Authorizations*
  Given the distinct possibility that the technical requirements and specifications for multilateration may be changed on reconsideration, the Commission should extend the time frame for type acceptance of multilateration LMS equipment until 12 months after the adoption of any final rule on reconsideration.

II. THE COMMISSION'S BAND PLAN AND LICENSING FRAMEWORK FOR LMS SYSTEMS WILL FRUSTRATE THE EFFORTS OF SMALL ENTREPRENEURIAL COMPANIES TO OPERATE LMS SYSTEMS

In reaching its band plan decision, the FCC was faced with the difficult task of furthering the development of diverse multilateration LMS systems. Pinpoint is concerned

that the band plan and licensing framework adopted will have the unintended effect of seriously hampering the competitive viability of small entrepreneurial companies hoping to provide the public with the benefits of innovative multilateration service. Indeed, the FCC's decision to auction all multilateration spectrum not subject to grandfathering inappropriately places entrepreneurial developers that can share spectrum, which the interim rules required, at a palpable disadvantage. Moreover, operational restrictions placed on multilateration licensees -- including limitations related to Part 15 devices, power levels and the need for aggregation of sub-bands to obtain adequate spectrum -- may well preclude small entrepreneurial companies that desire to deploy efficient technologies from succeeding in the LMS market. Pinpoint believes that FCC rules should not, in essence, select a favored LMS technology. The development of new LMS technologies is best governed by the marketplace, rather than by regulatory fiat. Accordingly, the new rules should be tailored (as specified in Sections III-VI) to ensure, consistent with statutory requirements, the participation of small entrepreneurial firms and, consistent with the FCC's stated goals, a diverse LMS marketplace.

A. The Band Plan and Operational Rules for Multilateration LMS, While Appropriately Accommodating Different LMS Systems, Unreasonably Restrict Systems Intending to Use Wideband Links

Pinpoint commends the FCC's tacit recognition of the legitimate role that wide bandwidth can play in efficient, cost-effective multilateration LMS design. While not ideal, the Commission's decision to allow licensees to aggregate sub-bands D through G provides at least a theoretical opportunity to operate an 8 MHz system multilateration LMS system in a given region. As Pinpoint has demonstrated in its previous comments, wider bandwidth

confers significantly greater-than-linear benefits for LMS systems both in ranging accuracy and location rates and therefore allows for the efficient provision of service to the public.[4] Pinpoint also supports the Commission's decision to permit licensees to operate wideband forward links over a system's entire authorized sub-band.[5]

Unfortunately, the *Order* also imposes a number of restrictions on a system that would choose to employ 8 MHz links in general and a wideband forward link in particular that substantially impede the ability of such a licensee competitively to use such links. For example, the extremely tight emission mask -- which must be revised for the reasons stated more fully in Section IV below -- makes it practically impossible to deploy LMS service using wide band forward link technology. In addition, the new competitive bidding licensing scheme requires LMS providers -- intending to operate 8 MHz systems in those areas where they do not have existing, grandfathered licenses -- to bid and win in two auctions in order to deploy a system because the requisite spectrum can only be obtained by aggregating sub-bands D and G with sub-bands E and F. Winning this combination of licenses will be a near impossibility, and extremely costly, especially for small, entrepreneurial systems bidding

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[4] *See, e.g., Ex parte* Letter from Louis H. M. Jandrell, V.P. Design and Development, Pinpoint Communications (dated September 15, 1994) at 7 ("Pinpoint September 15 *ex parte*"); *see also* C.N. Georghiades, "On the Effect of Bandwidth on the Performance of AVM Systems Operating in the 902-928 MHz ISM Band" dated December 7, 1994, submitted for inclusion in the Docket 93-61 record on December 7, 1994.

[5] *Order* at ¶ 76.

against deep pockets such as Southwestern Bell Mobile Systems and others that may participate.[6]

Further, licensees may operate wideband forward links with only 30 watts ERP.[7] This limit fails to recognize that licensees using wideband links will spread power over virtually all of a system's entire authorized spectrum, thereby reducing the possibility of interference. This alone is justification for operation at a higher power level. Moreover, the extremely low power limit for wideband forward links will require the construction of a more dense network of base stations to provide adequate coverage. This will be extremely costly and result in an inefficient infrastructure. Importantly, under the FCC's new rules -- as discussed in detail below -- grandfathered systems will *not* have this option, as they are limited to the number of sites licensed as of February 3, 1995, before which no such meager power limit was in place. For such licensees, the low power limits essentially preclude the provision of a usable, competitive service.

The new rules also require MTA licensees to demonstrate that their systems "do not cause unacceptable levels of interference" to Part 15 devices.[8] Yet the term "unacceptable levels of interference" is not defined. The Commission has given no guidance whatsoever as to the type of testing to be conducted to demonstrate the requisite conditions of compatibility. Indeed, the testing called for in the new rules differs fundamentally from that called for by

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[6] To avoid interference in "wide-band" sub-bands (*i.e.*, sub-bands B, D, and E), the FCC should modify its rules to provide that multilateration licensees may operate narrowband communications links within wide sub-bands *only* on a secondary basis to wideband transmissions engaged in the principal purpose for which the allocation was intended: vehicle location and monitoring activities using multilateration techniques.

[7] 47 C.F.R. § 90.205, as amended by the *Order*.

[8] 47 C.F.R. § 90.353(d).

Pinpoint earlier in this proceeding. Testing prior to adoption of the rules -- for example, that toward which the parties worked from September to December 1994 -- would likely have yielded extremely useful insights into system compatibility. Such testing could have given the Commission knowledge on which to base its allocation decision. Instead, the agency has adopted a requirement to test to a vague "standard" *after* spectrum has been auctioned and systems built. Such an approach is of questionable utility and will only create additional uncertainty in the LMS industry and opportunities for further disputes.

Not only do MTA multilateration licensees have to demonstrate that their systems do not cause "unacceptable interference" to Part 15, they have to accept interference received from a large class of Part 15 devices without recourse. As detailed below in Section V, given that the Commission's rules have never recognized that LMS licensees and other higher priority users of the band have been obligated to avoid interference to Part 15 devices and to accept interference therefrom, the *Order* fails to justify the need for these abrupt policy shifts and should be reconsidered.[9]

B. Given That the Record in This Proceeding Demonstrates the Technical Feasibility of Sharing, at Least Among Certain Types of Multilateration LMS Systems, the Commission's Plan to Auction All LMS Spectrum Should Be Modified to Allow for a Shared Sub-Band

The Commission should modify its plan to auction *all* of the multilateration spectrum not subject to grandfathering by licensing multilateration systems on a shared basis in the

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[9] As set forth below, Pinpoint believes that the new burden on LMS systems should be eliminated because the record does not support, or even propose, such a drastic action. If the Commission retains the requirement, however, it is essential that the FCC adopt specific definitions and guidelines that will aid LMS licensees in demonstrating that their systems will not cause unacceptable levels of interference to Part 15 devices.

919.75-927.75 MHz sub-band. Such an action would not only comport with the record evidence that sharing among entrepreneurial LMS systems is feasible, but also would be faithful to statutory requirements underlying the Commission's auction authority.

The Commission's decision to use competitive bidding to license multilateration LMS spectrum is based on the faulty premise that sharing among LMS licensees is not feasible and therefore that prospective license applications are by definition mutually exclusive.[10] The *Order*, however, merely states that "sharing among *unlimited* numbers of multilateration licensees is not technically feasible."[11] This unexceptional fact alone is not sufficient to support the conclusion that applications are mutually exclusive.[12] Neither Pinpoint nor other parties advocating sharing have never claimed that the band could be shared by an unlimited number of licensees. It is evident that it cannot. Yet under the *Order*'s reasoning, sharing could not take place in any service because an unlimited number of licensees cannot share any band.

If the Commission believes that, for technical or economic reasons, there is some finite (but unknown) number of licensees that would successfully share a given band, this

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[10] Section 309(j)(2) of the Communications Act permits auctions where: (1) mutually exclusive applications for initial licenses or construction permits are accepted for filing by the FCC; (2) the principal use of the spectrum will involve, or is reasonably likely to involve, the receipt by the licensee of compensation from subscribers in return for enabling those subscribers to receive or transmit communications signals utilizing the licensed frequencies; and (3) the public interest objectives of Section 309(j)(3) would be served by subjecting mutually-exclusive applications in the service to competitive bidding. 47 U.S.C. § 309(j)(2).

[11] *Order* at ¶ 62 (emphasis in original).

[12] Indeed, an unlimited number of Part 15 devices, for example, cannot operate in the same band. Yet the Commission has never suggested that exclusive use of spectrum for Part 15 devices is therefore appropriate.

would be no obstacle to sharing. As Pinpoint has previously explained, if the FCC were to open a filing window (and impose appropriate entry requirements) a finite number of applicants would be identified. A sharing negotiation process (as used in big LEOs), and economic considerations by the applicants will lead to consolidated and feasible sharing arrangements.[13] The number of licensees that can effectively share a sub-band cannot be ascertained in advance. That should be left to the negotiation process.

The record in this proceeding clearly indicates that such sharing is technically feasible among a significant number of the licensee participants. The *Order* expressly recognizes this fact. The *Order* finds that grandfathered licensees operating multilateration systems in the same geographic area can effectively reach "cooperative arrangements for sharing" of spectrum.[14] Further, the new rules provide that all such grandfathered licensees also must operate on a shared basis with the MTA auction winner.[15]

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[13] In its initial comments in this proceeding, Pinpoint suggested a detailed implementation procedure for sharing. Comments of Pinpoint Communications, Inc. (filed June 29, 1993, as corrected July 9, 1993). Briefly, the FCC would announce a one-day filing window for applications to operate multilateration LMS systems in a designated number of markets. To be acceptable for filing, applications would have to show a firm financial commitment of sufficient resources to build and operate a system for one year, use of a demonstrably proven technology, and the legal qualification to be a licensee. The FCC would then issue a public notice listing tentative licensees who had proffered applications acceptable for filing. These entities would constitute the "sharing group" and would have six months in which to agree to a sharing plan that would be subject to FCC approval. If unanimous agreement could not be reached within six months, the FCC would grant the applications and require that each member of the sharing group receive regular intervals of air time.

[14] *Order* at ¶ 62. *See* 47 C.F.R. § 90.353(e) (citing Section 90.173(b)). Moreover, the FCC's new rules also state that the Commission might impose time-sharing mechanisms to facilitate sharing. *Order* ¶ 95. This suggestion further supports Pinpoint's position that sharing is feasible and desirable.

[15] 47 C.F.R. § 90.353(e).

Indeed, since the inception of this proceeding, Pinpoint has demonstrated how time-sharing among multiple multilateration AVM systems could be implemented.[16] Two of the five wide-area AVM proponents are on record in this proceeding that, consistent with the then-current rules under which they designed their systems, spectrum can be time-shared.[17] The attached *Time-Sharing Report*, which describes actual time-sharing by Pinpoint and Uniplex Systems in Washington, D.C., demonstrates further the ability of such multilateration LMS licensees to time-share spectrum.[18]

Moreover, the Commission's determination that competitive bidding should be used to grant exclusive licenses is contrary to Section 309(j). First, Section 309(j)(6)(E) obligates the Commission to seek ways to avoid mutual exclusivity. This subsection provides that the Commission's competitive bidding authority shall not

> be construed to relieve the Commission of the obligation in the public interest to continue to use engineering solutions, negotiation, threshold qualifications, service regulations, and other means in order to avoid mutual exclusivity in application and licensing proceedings.[19]

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[16] Pinpoint's opening comments demonstrated how sharing among multilateration systems sharing could be accomplished technically through two simple mechanisms. *See* Comments of Pinpoint (June 29, 1993) at 16-20. To implement time sharing (1) each system must have its clock synchronized to a common standard and (2) there must be a schedule agreed upon in advance to control access to air-time. There are several possible standards for synchronization and a number of ways for systems to control access once synchronization has been achieved. *See id. See also* J. Pautler, J. Caten, and M. Bryan, "Report on the Uniplex-Pinpoint Time-Sharing Demonstration in Washington, DC" (April 24, 1995) *("Time Sharing Report")*, attached hereto as Appendix 1.

[17] *See, e.g., Ex parte* Letter of E.A. Yorkgitis, Jr., Counsel for Pinpoint (dated Aug. 12, 1994) at 2; *Ex parte* Letter of McNeil Bryan, President, Uniplex Corporation (dated September 30, 1994) at 2.

[18] *See* Appendix 1.

[19] 47 U.S.C. § 309(j)(6)(E).

As detailed above and throughout this proceeding, the *Order* fails to take these factors into account and contradicts its own repeated recognition that sharing among licensees is feasible.

In addition, the *Order* gives no consideration, as it must under Section 309(j)(2), to the requirement that even if mutual exclusivity is genuine among some systems, then auctions may be conducted only if they will promote the operation of multilateration LMS systems by small entrepreneurial businesses. Although the FCC may attempt to create conditions improving the ability of entrepreneurial companies to participate in auctions for multilateration LMS spectrum, the statute requires that the FCC determine that licensing through competitive bidding will promote the entry of small entrepreneurial companies *before* it decides to use auctions. As the Commission stated in the *Second Report and Order* in its *Competitive Bidding* proceedings, "a system of competitive bidding may only be used if it would promote the objectives of Section 309(j)(3), *even if the principal use of the spectrum otherwise satisfies the requirements for competitive bidding.*"[20] These objectives that would be promoted in this case by allocation of a shared sub-band include:

- The development and rapid deployment of new technologies;
- The availability of new and innovative technologies to the American people;
- The dissemination of licenses among a wide variety of applicants including *small business*, and businesses owned by minorities and women (collectively and individually known as "designated entities"); and
- Efficient use of the spectrum.[21]

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[20] *Implementation of Section 309(j) of the Communications Act - Competitive Bidding*, Second Report and Order, 9 FCC Rcd 2348, 2356 (1994) *recon.*, Second Memorandum Opinion and Order, PP Docket No. 93-253, FCC 94-215 (released Aug. 15, 1994).

[21] 47 U.S.C. §§ 309(j)(2)(B) and 309(j)(3) (emphasis added).

Here, the exclusive use of auctions to license multilateration LMS providers would impede, rather than promote, the above objectives.[22] Entities attempting to make available to American consumers new spectrum-sharing technologies would be strongly deterred from doing so if a license could be obtained only through costly competitive bidding for exclusivity. Exclusive licensing of spectrum could therefore well lock out small entrepreneurial companies unable to afford the cost of a license. What is especially ironic is that these entrepreneurs are the same entities explaining they do not need exclusive spectrum. As stated above, however, the Commission is obligated under its auction authority to ensure meaningful opportunities for such designated entities to secure licenses not only in structuring auctions, but also in deciding whether auctions are necessary or appropriate. Furthermore, it is plain that, as the FCC auctions more and more spectrum, shared bands will become increasingly essential to preserve opportunities for entrepreneurs, *i.e.*, to meet key congressional objectives set forth in Section 309(j)(3) of the Act.

Accordingly, Pinpoint urges the FCC to modify its band plan to license multilateration LMS systems on a shared basis in the 919.75-927.75 MHz sub-band. The Commission can still hold an auction for licensees that claim they cannot share spectrum, for example, at 904-909.75 MHz (and 927.75-928.00 MHz).

By making available a shared sub-band, in addition to auctioned spectrum, the Commission will support the entry of entrepreneurs that have developed systems. As a practical matter, these entrepreneurs will not be able to compete with deep pockets for

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[22] The Commission's band plan is antithetical to entrepreneurs intending to use wideband forward links. Indeed, despite the attempt in the rules to accommodate 8 MHz links, the band plan appears more an accommodation to three particular licensees that have sought exclusive spectrum: Teletrac in bands B and H, Southwestern Bell Mobile Systems in blocks D and G, and MobileVision in blocks E and F.

spectrum absent the adoption of extraordinary bidding credits and preferences, a difficult task given the few sub-bands to be auctioned. Further, by allowing for a shared-band, the Commission would encourage spectrum efficiency and properly discharge its statutory obligations under Section 309(j)(2).

III. THE GRANDFATHERING RULES SHOULD BE MODIFIED TO FOSTER A MORE COMPETITIVE LMS MARKETPLACE

Pinpoint strongly endorses the Commission's decision to grandfather existing licensees that have developed multilateration technologies that can be deployed in the next twelve months. By allowing existing licensees a reasonable time period in which to construct and operate their systems under the FCC's new rules, the Commission will expedite the widespread provision of multilateration LMS service to the public by those firms best able to provide it. However, a number of limited adjustments to the grandfathering rules are required to ensure that the rules serve the intended purpose of promoting a competitive LMS market characterized by high quality service at low prices.

A. Grandfathered Licensees Should Be Able to Build out Their Systems Within the BTAs in Which They Are Licensed

There are several reasons why grandfathered licensees should be permitted to build out sites in addition to those for which they held licenses on February 3, 1995. Perhaps foremost among these are considerations of competitive equity. Such a rule would permit entrepreneurial LMS licensees to expand their service areas consistent with their pre-existing

business plans[23] without unduly compromising the value of the spectrum for auctions. Pinpoint, for example, applied for approximately six base station sites in twenty cities with the goal of building a core system in each city and then expanding in the market and, ultimately, regionally. Firms such as Pinpoint should not now be penalized for realistically scaling their first applications to attainable initial service goals, rather than blanketing areas with licenses in a pell mell fashion and making a mockery of the FCC's licensing procedures.[24] At the same time, reasonable limits may be appropriate in recognition that the spectrum is to be auctioned.

Moreover, the extremely low power limitation on wideband forward links imposed by the new rules unexpectedly limit Pinpoint's licensed service areas, putting it at an additional competitive disadvantage. Under the old rules, there was no limit on effective radiated power. Pinpoint, as explained earlier in this proceeding,[25] planned to use 500 watt ERP base stations to achieve its initial coverage. But the *Order* limits wideband forward links to 30 watts ERP, over a 12 dB reduction. This reduction in signal power corresponds to a reduction in range of 50 per cent, resulting in a 75 per cent reduction in coverage area. This will necessitate construction of four times as many base stations to ensure the same system coverage. Hence, without a modification of the grandfathering rules, Pinpoint has no way to

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[23] Pinpoint notes that each of its current authorizations provides for service throughout an area defined by a 50 mile radius from city center coordinates.

[24] Pinpoint notes that Teletrac and MobileVision sought and obtained an obviously excessive number of licenses years before Teletrac filed its petition for rulemaking.

[25] *Pinpoint September 15* ex parte, *supra*, at 16.

compensate for this reduction in power because it cannot build more base station sites.[26] Accordingly, to ensure robust competition, Pinpoint urges the Commission to allow grandfathered licensees to build out their systems within the BTAs in which they are currently licensed.

This modification of the rules would not have a significant adverse affect on MTA licensees, as they are under an existing obligation to share with grandfathered licensees. 47 C.F.R. § 90.353(e). If such licensees are able to share in the area of heaviest traffic within the BTAs at issue -- areas in which Pinpoint's core systems are to be built -- as Pinpoint submits they will, then they should be able to share throughout the grandfathered BTA. Expansion of grandfathered licensees' service areas more commensurate with the licensees' reasonable expectations and considerations of economic viability will serve the public interest by enhancing competition for multilateration LMS services. Only by providing existing licensees such a meaningful opportunity to compete against the MTA licensee will the grandfathering provisions achieve their intended purpose of encouraging the emergence of a competitive LMS marketplace.

B. Grandfathered Licensees Should Be Limited to Twenty-Five BTAs

The Commission should limit the number of grandfathered licensees to twenty-five BTAs. This limitation, which the *Order* discussed but did not expressly adopt, would tend to

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[26] In the alternative, Pinpoint requests a higher power limit for wideband forward links of 500 watts ERP. Furthermore, it is no answer that, under the adopted rules, Pinpoint can use up to 500 kHz of narrowband forward links at 300 watts ERP. As Pinpoint explained earlier, in order to have the operational capacity and performance afforded by 8 MHz forward links (in the same band as its return link), at least 1.3 MHz of narrowband links would be needed, over 250 per cent of what is available. *See id.* at 11-15; *Ex parte* Letter of Louis H. M. Jandrell (dated Jan. 25, 1995) at 4-5.

ensure that while the competitive provision of multilateration service is encouraged, speculation in LMS spectrum is not rewarded. As stated above, certain AVM interests have filed voluminous applications entirely unrelated to any feasible construction plans. By placing a limit on the number of grandfathered markets, grandfathered licensees will be given a fair start among themselves.

Moreover, a limit of twenty-five BTAs would encourage the rapid deployment of LMS systems to the public in several ways. In the absence of a limit, potential bidders in the auction might consider the spectrum unreasonably devalued. Grandfathered licensees might seek to build scores of "skeleton" systems with the intent of being bought out by auction winners, rather than providing competitive service to the public. Further, spectrum made available by the adoption of a limit could be used by LMS developers that choose to share spectrum -- provided that the FCC allows shared bands -- thereby providing the public with the price and service benefits of additional competition.

C. Grandfathered Licensees Should Be Able to Modify Their Systems in the Future

In the event that the Commission continues to limit grandfathered systems to the existing number of sites, grandfathered licensees should be able to move their antenna sites after the construction deadline due to circumstances outside of their control. While the rapid deployment of LMS service to the public is an important goal, the tight construction deadline imposed by the *Order* might result in service that is sub-optimal due to unanticipated technical problems, lease difficulties, and natural disasters. The FCC's service goal would be advanced by affording licensees a measure of flexibility in such circumstances.

In the same vein, licensees should be able to modify operation parameters, including emissions designations, after April 1, 1996. This flexibility will allow grandfathered licensees to make adjustments as needed for compatibility with co-channel licensees. The ability to make such changes will also allow them to better serve customers and compete in the LMS marketplace.

Finally, grandfathered licensees should be able to modify their licenses after the construction deadline to add additional mobiles as their subscriber volumes expand. ITS applications in large markets may involve hundreds of thousands of vehicles. Yet grandfathered licenses based on initial applications may not have accommodated such a scale of service. As with site flexibility and operation parameters, permitting licensees to modify their authorization for increased traffic would serve the public interest in the establishment of a competitive LMS service that is responsive to subscribers' needs.

IV. THE SUB-BAND EMISSION MASK REQUIREMENT FOR MULTILATERATION SYSTEMS IS IMPOSSIBLE TO MEET, UNJUSTIFIED, AND INCONSISTENT WITH COMPARABLE MEASURES IN THE 902-928 MHZ BAND AND OTHER BANDS

The new rules impose an out-of-band emission mask requirement for multilateration systems that is so stringent that it will preclude the deployment, and indeed the technical viability, of multilateration systems. Multilateration systems, as currently designed and conceived, simply cannot meet this strict and unjustified specification at power levels needed for effective operation. Accordingly, Pinpoint joins the consensus proposal of all current multilateration LMS system proponents and several non-multilateration proponents in urging

the Commission to replace the adopted emission mask with specifications suited to a digitally modulated emission in a mobile environment.

The new emission mask prevents the use of any of the current LMS direct sequence spread spectrum technologies. To comply with the mask, LMS licensees would be forced to redesign their systems to reduce the chipping rates, thereby impairing significantly the performance of the systems and their utility to consumers. The mask is thus fatally flawed in that it undermines the FCC's asserted goal of encouraging the deployment of LMS systems that provide a useful service to the public.

Notably, all LMS interests in this proceeding opposed the emission mask proposed and adopted by the Commission. The lack of record support for the emission mask adopted is made all the more remarkable by the fact that the *Order* provides no meaningful rationale for the stringent mask adopted. Ostensibly, the stringent mask is designed, in part, to "protect" non-multilateration systems at 909.75 - 921.75 MHz, but there is no record evidence of multilateration interference to non-multilateration systems.

Moreover, the mask is far in excess of other comparable land mobile emission limitations and finds no support in the record. The newly adopted specification requires that licensees attenuate their emissions by 55 + 10log(P) dB at the edges of the specified LMS sub-bands.[27] For a 30 watt mobile, this specification is much more strict than the specifications for general Part 15 emissions *inside* the 902-928 MHz band,[28] the general

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[27] *Order* at ¶ 98.

[28] *See* 47 C.F.R. §§ 15.209 and 15.249(a).

Part 90 mask requirements,[29] and the limitation for high speed digital data in microwave bands.[30]

For multilateration systems, Pinpoint thus supports the LMS consensus position that the FCC should replace the emission mask with the following specifications, which are appropriate for digitally modulated emissions in a mobile environment:

A. For the LMS wideband emissions:

For LMS wideband emissions, operating in the 902-928 MHz band, in any 100 kHz band, the center frequency of which is removed from the center of authorized sub-band(s) by more than 50 percent up to and including 250 percent of the authorized bandwidth: The mean power of emissions shall be attenuated below the maximum permitted output power,[31] as specified by the following equation but in no case less than 31 dB:

$A = 16 + 0.4 (P - 50) + 10\log B$ (attenuation greater than 66 dB is not required)

where A = attenuation (in decibels) below the maximum permitted output power level,
P = percent removed from the center of the authorized sub-band(s),
B = authorized bandwidth in megahertz.

B. For the LMS high power narrowband forward link transmissions:

For LMS narrowband forward link emissions, the power of any emission shall be attenuated below the transmitter power (P), in accordance with the following schedule:

i) on any frequency outside the authorized sub-band and removed from the edge of the authorized sub-band by a displacement frequency (fd in kHz): at least $116 \log10 ((fd+10)/6.1)$ decibels or $50 + 10 \log10(P)$ decibels or 70 decibels,

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[29] *See id.* at § 90.209(c)(1)(i)-(iii).

[30] *Id.* at § 21.106(a)(1).

[31] The formula assumes a maximum permitted output power of 30 W. If more than 30 watts is permitted for wideband forward links, the required attenuation should be adjusted commensurately (*e.g.*, if the maximum permitted output power is 300 W, the required attenuation relative to the maximum should increase by 10 dB).

> whichever is the lesser attenuation. A minimum spectrum analyzer resolution bandwidth of 300 Hz shall be used when showing compliance.

These limits are realistic for multilateration systems.

Pinpoint submits that for LMS, frequency tolerance limitations in Section 90.213 should be of secondary concern to Section 90.209 out-of-band emissions specifications. First, the LMS sub-bands are not channelized, a situation in which a tight frequency tolerance would be more meaningful. Second, if an LMS system meets the Section 90.209 emission limits, it should not cause interference to neighboring systems in adjacent bands. Moreover, the frequency tolerance set forth in Section 90.213 does not apply cleanly to multilateration wideband forward and return signals. In practice, these signals are spread over several MHz of bandwidth. As such, measuring a center frequency with any degree of accuracy is not only difficult, but may be somewhat arbitrary depending on how "center frequency" is defined. Accordingly, Pinpoint proposes that the frequency tolerance set forth in Section 90.213 be eliminated for wideband forward and return links in multilateration systems.[32] The frequency tolerance for other multilateration emissions should be relaxed to 0.0005 percent, as originally proposed in the *NPRM*.

V. THE COMMISSION SHOULD MODIFY ITS RULES CONCERNING THE PRIORITY OF USE BETWEEN MULTILATERATION LMS AND NOMINALLY SECONDARY PART 15 AND AMATEUR OPERATIONS

The Commission should reaffirm the priority of use of multilateration systems over Part 15 devices and amateur operations by eliminating the requirement that MTA auction

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[32] This would be consistent with the approach taken for wideband PCS systems wherein an emission mask is specified, but frequency tolerance is not specified. 47 C.F.R. § 24.235 ("The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.").

winners demonstrate that they will not cause "unacceptable levels of interference" to such secondary services. The *Order* purported to reaffirm the existing priority of uses in the 902-928 MHz band.[33] The new rules, however, under certain vaguely-defined circumstances effectively accord Part 15 devices priority to the multilateration sub-bands over nominally primary multilateration licensees. This abrupt departure from Commission precedent and existing policy and is not justified. Nor is it a logical outgrowth of what was proposed in the *NPRM*. Accordingly, Pinpoint urges the FCC to modify its rules to clarify the primacy of multilateration LMS uses.

The characteristics of the primary-secondary relationship are well established. The secondary user (1) must not cause harmful interference to the primary user and (2) must accept any interference received from the primary user. While the *Order* incorporates the established "harmful interference"[34] Part 15 definition, it carves out a number of broad exceptions. Under the new rules, all indoor and outdoor Part 15 devices (and amateur radios) operating within a certain sliding height-power scale are deemed, as a matter of law, incapable of causing harmful interference to multilateration systems.[35] Indeed, the

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[33] *Order* ¶ 36.

[34] The Commission's Rules define harmful interference from Part 15 devices as "[a]ny emission, radiation or induction that endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance" with its rules. 47 C.F.R. § 15.3(m).

[35] *Id.* at § 90.361. This unrebuttable presumption would apparently apply even if a Part 15 device were used to cause intentional interference to licensed LMS operators. Remarkably, the licensed operator may have absolutely no recourse in such a situation. The irony is that the FCC adopted this unrebuttable presumption -- that, under certain conditions, Part 15 devices could not cause interference to multilateration systems -- in the same *Order* where it concluded that the agency was not in a position to ascertain the potential for multilateration systems to interfere with each other. *Order* ¶ 44.

attenuate power with height. Under the Hata model of propagation, going from 5 to 15 meters yields a 26 dB increase in power. But the Commission's new rule would require Part 15 devices to attenuate power by only 10 dB in this situation, *a net increase* of 16 dB in effective power. This is a conservative analysis, as antennas are much more likely at 15 meters than at 5 meters to have direct line-of-sight to LMS base stations, which typically will be at altitudes of 60 to 80 meters. The net increase from a device at a height of 15 meters could thus be as much as 34 dB, an effective increase in power of over *2500* times.

Further, all MTA multilateration licensees must demonstrate that they will not cause "unacceptable levels" of interference to Part 15 devices, including to those operating outside of the sliding height-power scale.[36] The term "unacceptable interference" is totally vague. Unacceptable to whom?

Thus, in a broad range of circumstances, multilateration LMS systems must accept interference received from Part 15 devices and amateur stations and may not cause unacceptable interference to *all* Part 15 devices. *In short, as a general matter, multilateration systems are secondary to Part 15 devices.*

This new priority scheme represents a radical and unexplained deviation from existing FCC policy and Section 15.5(b) of the Commission's rules. Indeed, the new rules upsetting the heretofore consistent relationship between licensed and unlicensed devices were not foreshadowed by the proposals in the *NPRM*. Their adoption is thus not a logical outgrowth of the *NPRM*, and therefore requires a separate rulemaking under Part 15 to be validly enacted in accordance with the Administrative Procedures Act. The Commission cannot, as it has attempted, evade this procedural requirement by altering Section 15.5(b) indirectly

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[36] *See* 47 C.F.R. § 90.353(d).